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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/697,098	10/31/2003	Masahiro Tadauchi	040301-0639	9009

22428 7590 03/14/2007  
FOLEY AND LARDNER LLP  
SUITE 500  
3000 K STREET NW  
WASHINGTON, DC 20007

EXAMINER
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ZIMMERMAN, JOHN J

ART UNIT	PAPER NUMBER
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1775

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/14/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

Application No.

10/697,098

Applicant(s)

TADAUCHI ET AL.

Examiner

John J. Zimmerman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 December 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3,4,6,8,9,11,13,14,16,18,19 and 22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3,4,6,8,9,11,13,14,16,18,19 and 22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## FOURTH OFFICE ACTION

### *Amendments*

1. The AMENDMENT AND REPLY UNDER 37 CFR 1.111 received December 20, 2006 has been entered and considered. Claims 1, 3-4, 6, 8-9, 11, 13-14, 16, 18-19 and 22 are pending in this application.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 3-4, 6, 8-9, 11, 13-14, 16, 18-19 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tadauchi (Japanese publication 2002-283093).
4. Tadauchi '093 discloses a lead-free joining material comprising a tin alloy containing between 3-12 wt.% zinc and further containing 1-3 wt.% bismuth (e.g. see paragraphs [0010], [0015]-[0016]; Figure 1). The particles are made by solidifying droplets of the molten alloy

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composition (e.g. see paragraph [0023]). The solidified spherical particles of this composition result in concentration zones of alloy constituents (e.g. see paragraph [0025]; Figure 3). The particles are mixed with a flux and a solder paste is created (e.g. see paragraph [0026]) and applied to a substrate and reflowed (e.g. see paragraph [0028]). Tadauchi '093 may differ from the pending claims in that Tadauchi '093 may not describe the surface layer as having a depth of 2  $\mu\text{m}$ , may not describe the concentration of bismuth in the solid-solution phase in a range of 0.6 to 4.0 wt.% and may not describe a needle crystal dispersed in the solid-solution phase including zinc as a main component. Although Tadauchi '093 may not describe these features of the particles, it would be reasonable to expect that these features would be present in the particles of Tadauchi '093 since a review of applicant's disclosure shows that the surface layer, concentration of bismuth and the needle crystals are a result of using the composition of Tadauchi '093 when solidifying the tin-zinc-bismuth alloy into particles. Although Tadauchi's process may differ from applicant's process in that Tadauchi may solidify the particles in mineral oil (e.g. paragraph [0024]) and applicant discloses (but not claims) solidifying in an inert atmosphere (e.g. page 11, bottom paragraph), there is no evidence of record in this prosecution that the solidification medium is critical to the microstructure of the end product. The applicant's specification does not disclose that any particular cooling rate is necessary or critical to achieve the claimed invention nor do the pending method recitations require any particular critical cooling rate in the production of the claimed microstructure. Since Tadauchi's cooling rate is at least sufficient to reproduce core and surface layer concentration zones of alloy constituents, barring evidence to the contrary, one of ordinary skill in the art would reasonably expect the process of Tadauchi to also produce the recited microstructure of the particles in the rejected claims. In addition, since

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no cooling medium or cooling rate is required during the claimed solidification steps it must be assumed that the cooling medium and/or cooling rate is not critical to the formation of the claimed microstructure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976).

Patent and Trademark Office can require applicants to prove that prior art products do not necessarily or inherently possess characteristics of claimed products where claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes; burden of proof is on applicants where rejection based on inherency under 35 U.S.C. § 102 or on prima facie obviousness under 35 U.S.C. § 103, jointly or alternatively, and Patent and Trademark Office's inability to manufacture products or to obtain and compare prior art products evidences fairness of this rejection, *In re Best, Bolton, and Shaw*, 195 USPQ 431 (CCPA 1977). The fact that applicant has closely observed the tin-zinc alloy particles and described their microstructure in more detail than Tadauchi '093, does not differentiate the claimed subject matter from the particles of Tadauchi '093. Discovery of a new property or use of previously known composition, even if unobvious from the prior art, cannot impart patentability to claims to known composition, *In re Spada*, 15 USPQ2d 1655 (Court of Appeals, Federal Circuit 1990). Regarding the overlapping ranges of the alloying constituents, the subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have selected the overlapping portion of the range disclosed by the reference because overlapping ranges have been held to be a *prima facie* case of obviousness, see *In re Malagari*, 182 USPQ 549.

***Response to Arguments***

5. Applicant's arguments filed December 20, 2006 have been fully considered but they are not persuasive with regards to the remaining rejection.

6. Regarding the remaining rejection of claims 1, 3-4, 6, 8-9, 11, 13-14, 16, 18-19 and 22 under 35 U.S.C. 103(a) as being unpatentable over Tadauchi (Japanese publication 2002-283093), applicant argues that Tadauchi fails to teach or suggest that the surface layer has a greater concentration of the additive element than the core part and an average concentration of the additive element in a range of 0.6-1.0 wt. percent. The rejection under 35 U.S.C. 103(a) clearly addresses these issues. Patent and Trademark Office can require applicants to prove that prior art products do not necessarily or inherently possess characteristics of claimed products where claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes; burden of proof is on applicants where rejection based on inherency under 35 U.S.C. § 102 or on prima facie obviousness under 35 U.S.C. § 103, jointly or alternatively, and Patent and Trademark Office's inability to manufacture products or to obtain and compare prior art products evidences fairness of this rejection, *In re Best, Bolton, and Shaw*, 195 USPQ 431 (CCPA 1977). While Tadauchi may not describe these features of the particles, it would reasonable to expect that these features would be present in the particles of Tadauchi '093 since a review of applicant's disclosure shows that the surface layer, concentration of bismuth and the needle crystals are a result of using the composition of Tadauchi '093 when solidifying the tin-zinc-bismuth alloy into particles. Although Tadauchi's process may differ from applicant's process in that Tadauchi may solidify the particles in mineral oil (e.g. paragraph

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[0024]) and applicant discloses (but not claims) solidifying in an inert atmosphere (e.g. page 11, bottom paragraph), there is no evidence of record in this prosecution that the solidification medium is critical to the microstructure of the end product. The applicant's specification does not disclose that any particular cooling rate is necessary or critical to achieve the claimed invention nor do the pending method recitations require any particular critical cooling rate in the production of the claimed microstructure. Since Tadauchi's cooling rate is at least sufficient to reproduce core and surface layer concentration zones of alloy constituents, barring evidence to the contrary, one of ordinary skill in the art would reasonably expect the process of Tadauchi to also produce the recited microstructure of the particles in the rejected claims. In addition, since no cooling medium or cooling rate is required during the claimed solidification steps, it must be assumed that the cooling medium and/or cooling rate is not critical to the formation of the claimed microstructure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976)(critical or essential limitations must be contained in the claims). The fact that applicant has closely observed the tin-zinc alloy particles and described their microstructure in more detail than Tadauchi '093, does not differentiate the claimed subject matter from the particles of Tadauchi '093. Discovery of a new property or use of previously known composition, even if unobvious from the prior art, cannot impart patentability to claims to known composition, *In re Spada*, 15 USPQ2d 1655 (Court of Appeals, Federal Circuit 1990).

### ***Conclusion***

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action

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is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John J. Zimmerman whose telephone number is (571) 272-1547. The examiner can normally be reached on 8:30am-5:00pm, M-F. Supervisor Jennifer McNeil can be reached on (571) 272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

9. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



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John J. Zimmerman  
Primary Examiner  
Art Unit 1775

jjz  
March 6, 2007